DIY Travel Ukulele Instructions

Foreword

Thank you for requesting the instructions to make your very own “DIY Travel Ukulele”. Before starting the steps to make this instrument, it is recommended that you read through all of the steps. That way, you will have a high level view of the process and will know the destination before you start. The parts for this project can be obtained at a home improvement store (Home Depot, Lowe's, etc.), Radio Shack, and a music supply store (Stewart-Macdonald, Grizzly, C.B. Gitty, etc.). Throughout this project, if any questions or comments arise, feel free to email CircuitsAndStrings@gmail.com.

Safety

Always wear safety glasses or goggles when operating equipment. Everyday glasses or reading glasses are not safety glasses. Be certain the safety glasses you wear meet the appropriate standards of the American National Standards Institute (ANSI).

Because there are various ways to cut and join wood, you can make substitutions for the methods stated in this plan. We try to suggest the easiest methods possible. However, only you know your skills with each piece of machinery. Never compromise your safety by using a cutting method with which you are not comfortable. Instead, find an alternative approach that will yield the same result.

These instructions assume that you are intimately familiar with the safe operation and use of woodworking machinery and woodworking tools, and understand the techniques used to repro- duce this project. If you do not qualify for both of these criteria, **STOP building this project for your own safety.** Read and understand the owner’s manual for the machinery you intend to use, take a woodworking class or visit your local library for more information. Woodworking machinery and tools are inherently dangerous, because they use sharp edges that can and will cause serious personal injury including amputation and death. Do not underestimate the ability of these tools and machinery to cause injury. Never operate any tool without all guards in place and always wear approved safety glasses. For your own safety, please heed this warning.

In short, be careful while doing this project. By using these instructions, you assume all risks associated with this project.

Needed Parts: (measurements are in inches, unless otherwise noted)

- .25 X 1.5 oak board
- .75 X .75 oak or poplar square molding
- .5 X 1.5 oak board
- .5 quarter round oak or other wood molding
- .75 quarter round oak molding
- Fretwire (about 30 inches)
- 4 guitar style tuners
- .5 X .75 angled aluminum (about 4 inches)
- 1 straight cabinet handle
- Assorted screws and bolts
- 6 corner braces
- 2 flat corner braces
- 8 small eye screws
- Set of nylon ukulele strings

Optional Parts:

- .25 X 6 oak board (for back of ukulele)
- 1 piezo buzzer (for amplification)
- 1 square jack plate (for amplification)
- 1 mono audio jack (for amplification)
- 2 strap pegs
- Fret inlays

Needed Supplies:

- Gorilla Glue
- Polyshade stain (or other stain/clear coat combination)
- Stainable wood putty
- Sand paper

Needed Tools:

- Drill
- Assorted drill bits
- Metal File
- Miter box
- Saw for miter box
- Thin bladed saw

Optional Tools:

- Soldering Iron

INSTRUCTIONS:

1. Cut .5 X 1.5 board into two 5 inch lengths.
2. Cut .5 X 1.5 board into one 3.75 inch length.
3. Cut .5 quarter molding into two 1.5 inch lengths.
4. Cut .75 X .75 square molding into two 3.75 inch lengths.

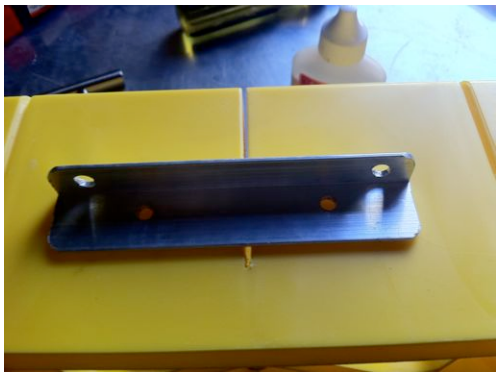
5. Glue the seven pieces together with Gorilla Glue to form a box.

6. Mark and drill pilot holes for the metal corner braces. The two on the back of the box will be flush with the top. The two on the front of the box will be halfway between the top and the bottom. The holes on the front of the box will go all of the way through the wood. Small bolts will be used to secure this side of the braces to the wood. Use short (.25 inch) screws to secure the metal to the wood so that they don't poke through the wood.

7. Mark and drill pilot holes for the metal flat corner braces on the bottom.

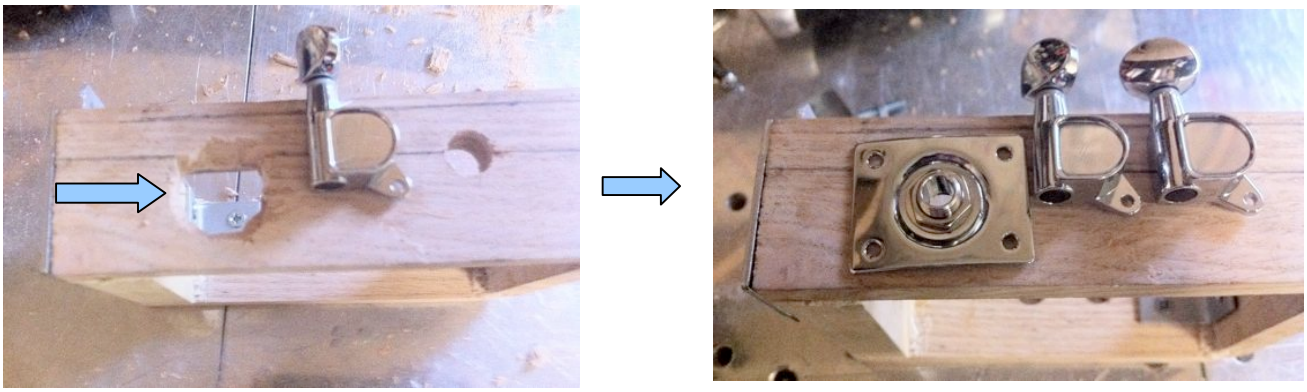
8. Cut the angled aluminum into a 3.75 inch length.

9. Drill holes for the cabinet handle on the narrower (.5 inch) side of the angled aluminum. Drill two holes about .75 inches closer to middle on the wider side of the aluminum. If desired, round off the edges of the aluminum with a file. This piece, and the cabinet handle will serve as the bridge. Drill holes on the back top of the box for the screws that will attach the aluminum to the box.



10. Drill four holes for the desired guitar style tuners. Mount the tuners as close to the front of the box as possible.

11. If amplification is desired, drill out a hole for the mono audio jack and square jack plate.



12. Use eight small eye screws to guide the strings off of the cabinet handle to the tuners. The four eye screws in the middle should be spaced to the desired string spacing. The eye screws on the sides should be placed so that they are in line with the guitar tuners. If amplification is being used, place the two eye screws on the side of the jack plate so they miss the audio jack.

13. On the top of the box, two metal corner braces will be mounted with the small bolts through the wood to the metal braces on the inside of the box. The braces on the top of the box will form a channel to mount the neck. If desired, have one of the bolts longer so that a strap peg can be mounted on top of the bracket. The other strap peg will be in the middle of the wood on the back bottom of the box.

14. If more resonance is desired, take a .25 X 6 board and trim it to fit the bottom of the box. Then Gorilla Glue it to the bottom of the box.

15. Take two lengths of .75 quarter round molding and glue them together to form a half round. The half round will be the neck. The length of these two pieces will depend on the desired scale length and the desired length behind the nut. For a 13-7/8" scale, cut the two .75 quarter round pieces of molding into 12 inch lengths and Gorilla Glue them together.

16. Take a .25 X 1.5 board and cut a fret slot using a thin bladed saw and a precision miter box about an inch from one edge. This slot will eventually have fretwire hammered into it and serve as the “zero fret”. The picture below gives an example of a “zero fret”. The “zero fret” is the nut for our instrument.

17. Now the board is ready for the fret slots. The fret slots should be cut in reference to the “zero fret” slot. The prototype “DIY Travel Ukulele” fret slots were cut using a mandolin fingerboard as a guide. Carefully mark the where the slots should be using a fret guide, another short scale instrument, or using a fret position calculator. (I have included a 13 7/8 inch scale and a 15 inch scale guide at the end of these instructions.) This is a critical step. The fret slots need to be very accurate, or the intonation of the instrument will be wrong. Once the fret slots are marked, cut the fret slots using a thin bladed saw and a precision miter box.

18. Place the slotted fretboard on top of the half round neck. Place the neck and fingerboard in place on the box. Now the neck will need to be trimmed. The 12th fret needs to be exactly half the distance between the nut and the cabinet handle bridge. The cabinet handle bridge can be adjusted a little, but make it close. Trim the extra part off of the neck. Trim the fingerboard so that it overlaps the end of the neck by about .5 to .75 inches. The nut side of the fingerboard and the neck should be flush. The body side of the fingerboard should overlap the neck. Gorilla Glue the fingerboard and the neck together.

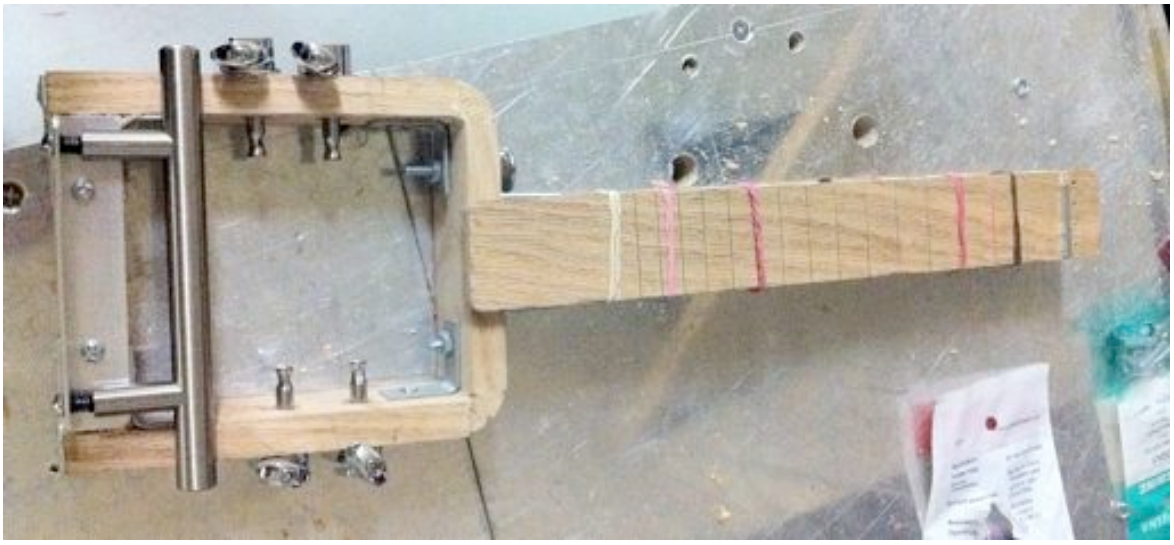
19. Round off the nut end of the neck. This adds elegance to the end product.

20. Drill four holes though the fingerboard and the neck behind the nut. The holes should be small. These holes are for the nylon ukulele strings, so they need to be spaced to the desired string spacing and just large enough for the thickest string.

21. On the underside of the neck, shallowly auger out the string holes so that the string knots can rest in the holes.

22. Position the neck in place with the two metal brackets forming the channel. Drill holes for the screws that will attach the neck to the brackets. Make sure that the neck is able to be attached to the body straight and level.

23. At this point, all of the hardware (except for the frets and strings), should be in place. Making sure the hardware and wood fits together is a nice thing to do *before* the wood is sanded and stained.



24. Take off all of the hardware and set aside. Fill and level the wood with stainable wood putty. Sand the wood and putty until everything is as smooth as desired.

25. The frets can be put on now or later. For the prototype, the neck and fingerboard were stained and then the frets were put on. Then the frets were filed down and and shaped. The filing process scuffed the stain, so these parts needed to be touched up.

26. Stain the box and neck to desired color. Polyshade (by Minwax) is a combination of stain and polyurethane and worked well for the prototype.

27. Put the frets on now if that wasn't done earlier. Touch up the stain as needed.

28. If desired, put fret inlays on fingerboard.

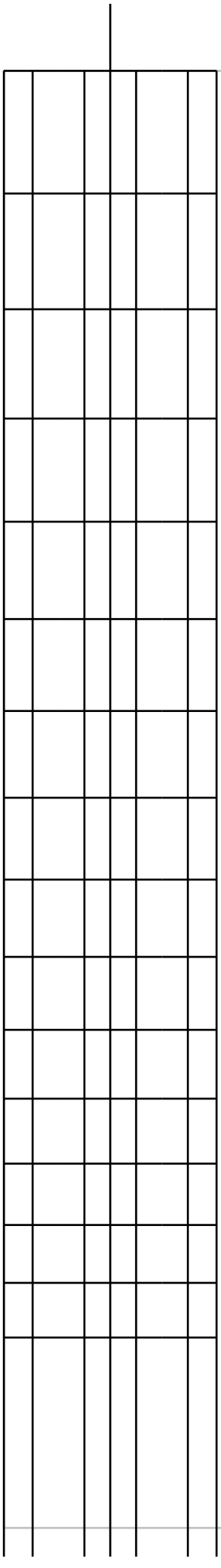
29. Reattach all of the hardware. Make sure the neck is square and level. Use washers as shims under the braces on the outside of the box to straighten out, if needed.

30. If amplification is desired, solder a piezo buzzer to the mono audio jack. (Red wire to the tip lug and black wire to the shaft lug). Attach the piezo buzzer to the wood.

31. Tie knots to the end of the strings and thread them through the holes in the neck. Thread them through the eye screws and to the tuners.

32. Adjust the cabinet handle bridge to adjust the intonation, as needed.

33. Tune up the strings and rock! **Make a YouTube video about your instrument and/or take pictures of it. Share the link or pictures to CircuitsAndStrings@gmail.com.**



15 inch scale fretting guide

13 7/8 inch scale fretting guide